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Occupational contact allergy caused by benzidine in three tannery workers

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Key words: allergic contact dermatitis; benzidine; contact dermatitis; tannery workers.

In the context of an ongoing study at two leather tanneries in Indonesia (1), we patch tested all 184 workers with the European baseline series, the shoe series, and a number of additional allergens, including benzidine (1% pet). The selection of additional allergens was based on an inventory of the chemicals used at these factories (1). Patch tests were read on days 2, 4, and 7, as recommended by the International Contact Dermatitis Research Group (2). A positive reaction to benzidine was observed in 3 workers.

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Case 1

A 38-year-old female tannery worker had occupational contact dermatitis on her wrists, forearms, and palms. She had worked for 19 months at the finishing department of the tannery, and was involved in measuring and packing the leather after a protective and decorative coating had been applied. No signs of atopic constitution were found. Patch testing showed positive reactions to *Myroxylon pereirae* (+), fragrance mix I (+), fragrance mix II (+), and benzidine (+). The inventory of the chemicals at this tannery showed that a benzidine-based dye was still used. No other allergens were present at the patient's work station.

Case 2

A 46-year-old female tannery worker had occupation-related dermatitis on her hands, wrists, and forearms. The dermatitis appeared after she started to work at the tannery. Her dermatitis worsened after she had been exposed to chemicals at the tannery and to detergents when she washed her hands. She had worked at this tannery for almost 5 years. She had no other part-time job besides her main work. Her main duty was preparing chemicals for the tanning process. She always wore synthetic rubber gloves when working with the chemicals. She had a history of atopic dermatitis. Patch testing showed positive reactions to hydroquinone monobenzylether (+), primin (+), and benzidine (+). On the basis of our observational study at this tannery, there was no exposure to hydroquinone monobenzylether or primin, and we could not find any benzidine-based dyes.

Case 3

A 41-year-old male tannery worker had a history of tannery work-related dermatitis on his hands, wrists, and forearms. The dermatitis appeared when he had started to work at the tannery. It worsened when he was exposed to chemicals at his workplace, and healed when he had a few days of leave. He had worked at this tannery for 18 years. He had no other part-time job besides his main work at the tannery. He had a history of atopic dermatitis. On skin examination, there were no prominent skin lesions, and we noted only that he had a dry skin. Patch testing showed positive reactions to *N*,*N*-diphenylguanidine (+) and benzidine (+). On the basis of the observational study at this tannery, there was no exposure to *N*,*N*-diphenylguanidine, benzidine, or any benzidine-based dyes.

Discussion

Benzidine and its derivatives have been used to manufacture dyes for many years (3). Sensitization to benzidine as one of the standard allergens was reported three decades ago in 5% of 4600 patients patch tested in a 5 year period between 1973 and 1977 in Spain (4, 5). In 1978, several countries banned the manufacture of dyes from benzidine because of its potential carcinogenic effect (3), so there are no recent reports on benzidine sensitization.

Although substitutes for benzidine-based dye are plentiful, continued demands from the textile and the leather industries for the original dyes made from benzidine and its related compounds have persisted in newly developing industrial countries (3).

In case 1, there was a relevant current exposure to a benzidine-based dye during her work in the finishing process. In cases 2 and 3, we found sensitization to benzidine without any current relevant exposure to benzidine in the workplace. The possibility of past exposure to benzidine-based dyes in these two workers cannot be excluded. In conclusion, this report shows possible exposure to benzidine-based dyes in tanneries in newly developing countries.

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